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INTERNATIONAL PRELIMINARY EXAMINATION REPORT (PCT Article 36 and Rule 70)

24 SEP 2004



Applicant's or agent's file reference JWOP0218		FOR FURTHER ACTION See Notification of Transmittal of International Preliminary Examination Report (Form PCT/PEA/4-16)	
International application No. PCT/GB 03/01327	International filing date (day/month/year) 20.03.2003	Priority date (day/month/year) 27.03.2002	
International Patent Classification (IPC) or both national classification and IPC F25D15/00			
Applicant DYSON LTD			

1. This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36.
2. This REPORT consists of a total of 5 sheets, including this cover sheet.

This report is also accompanied by ANNEXES, i.e. sheets of the description, claims and/or drawings which have been added and are the basis for this report and/or sheets containing rectifications made before this Authority under Article 17.16 and Section 607 of the Administrative Instructions under the PCT).

The ANNEXES consist of a total of 4 sheets.

3. This report contains indications relating to the following items:
 - I ☒ Basis of the opinion
 - II ☐ Priority
 - III ☐ Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
 - IV ☐ Lack of unity of invention
 - V ☒ Reasoned statement under Rule 66.2(a)(ii) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
 - VI ☐ Certain documents cited
 - VII ☐ Certain defects in the international application
 - VIII ☐ Certain observations on the international application

Date of submission of the demand 17.10.2003	Date of completion of this report 12.07.2004
Name and mailing address of the international preliminary examining authority:  European Patent Office - P.B. 5818 Patentlaan 2 NL-2280 HV Rijswijk - Pays Bas Tel. +31 70 340 - 2040 Tx: 31 651 epo nl Fax: +31 70 340 - 3016	Authorized Officer Yousufi, S Telephone No. +31 70 340-2823 

**INTERNATIONAL PRELIMINARY
EXAMINATION REPORT**

International application No. **PCT/GB 03/01327**

I. Basis of the report

1. With regard to the **elements** of the international application (*Replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report since they do not contain amendments (Rules 70.16 and 70.17)*):

Description, Pages

1, 3-7 as originally filed
2 filed with telefax on 03.06.2004

Claims, Numbers

2-11 as originally filed
1, 12-22 filed with telefax on 03.06.2004

Drawings, Sheets

1/4-4/4 as originally filed

2. With regard to the **language**, all the elements marked above were available or furnished to this Authority in the language in which the international application was filed, unless otherwise indicated under the form.

These elements were available or furnished to this Authority in the following language:

- ☐ the language of a translation furnished for the purposes of the international search (under Rule 23.1(b)).
☐ the language of publication of the international application (under Rule 48.3(b)).
☐ the language of a translation furnished for the purposes of international preliminary examination (under Rule 55.2 and/or 55.3).

3. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, the international preliminary examination was carried out on the basis of the sequence listing:

- ☐ contained in the international application in written form.
☐ filed together with the international application in computer readable form.
☐ furnished subsequently to this Authority in written form.
☐ furnished subsequently to this Authority in computer readable form.
☐ The statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.
☐ The statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished.

4. The amendments have resulted in the cancellation of:

- ☐ the description, pages:
☐ the claims, Nos.:
☐ the drawings, sheets:

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**INTERNATIONAL PRELIMINARY
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5. ☐ This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed (Rule 70.2(c)).

(Any replacement sheet containing such amendments must be referred to under item 1 and annexed to this report.)

6. Additional observations, if necessary:

V. Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Yes: Claims	4 7-10 12 17
	No: Claims	1 2 3 5 6 11 13 15 16 18-22
Inventive step (IS)	Yes: Claims	
	No: Claims	1-22
Industrial applicability (IA)	Yes: Claims	1-12 14-21
	No: Claims	13 22

2. Citations and explanations

see separate sheet

**INTERNATIONAL PRELIMINARY
EXAMINATION REPORT - SEPARATE SHEET**

International application No. PCT/GB03/01327

Re Item V

Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. The document US-A-2 401 613 was not cited in the international search report.
2. The application does not meet the requirements of Article 6 PCT, because amended claims 1, 5, 14 are not clear.
 - 2a. The feature of amended claims 1 and 14, that the '...refrigerating apparatus forming part of a refrigerator...' and '...in a refrigerator...' is not referred to in the description and drawings. Amended claims 1 and 14 are therefore not supported by the description as required by Article 6 PCT.
 - 2b. Amended claim 1 attempts to define a refrigerating apparatus with reference to a refrigerator in which said refrigerating apparatus is employed. It is not clear whether the features of the refrigerator are part of the claimed apparatus.
 - 2c. The term '...substantially ...' used in amended claim 5 is vague and unclear and leaves the reader in doubt as to the meaning of the technical feature to which it refers, thereby rendering the subject-matter of said claim unclear, Article 6 PCT.
3. Furthermore, the above-mentioned lack of clarity notwithstanding, the subject-matter of amended claims 1 and 14 is not new in the sense of Article 33(2) PCT, and therefore the criteria of Article 33(1) PCT are not met.

With respect to amended independent **claim 1** US-A-2 401 613 discloses (the references in parentheses applying to this document):

Refrigerating apparatus for chilling an object, the refrigerating apparatus forming part of a refrigerator (10, see also point 2 above) and comprising a chamber (13) having a longitudinal axis, an inlet (45) and an outlet (46) spaced along the longitudinal axis, with means (20) for generating a fluid flow, the rotation means (20) are provided for causing the fluid flow to follow a helical path about the longitudinal axis within the chamber between the inlet (45) and the outlet (46).

The same reasoning applies, mutatis mutandis, to the subject-matter of the corresponding amended independent **claim 14**, which therefore is also considered not new.

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**INTERNATIONAL PRELIMINARY
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International application No. PCT/GB03/01327

4. Dependent claims 2-13 and 15-22 do not contain any features which, in combination with the features of any claim to which they refer, meet the requirements of the PCT in respect of novelty (2, 3, 5, 6, 11, 13, 15, 16, 18-22) and/or inventive step (4, 7-10, 12, 17), see documents US-A-2 401 613 and US-A-5 207 762 (Figure 1, number 24).
5. Amended claims 13 and 22 contain references to the description and/or the drawings. According to Rule 6.2(a) PCT, claims should not contain such references except where absolutely necessary, which is not the case here.
6. Amended independent claim 14 is not in the two-part form in accordance with Rule 6.3(b) PCT.
7. The features of the claims are not provided with reference signs placed in parentheses (Rule 6.2(b) PCT).

It is an object of the present invention to provide a refrigerating apparatus suitable for chilling objects rapidly.

5 The invention provides refrigerating apparatus for chilling an object, the refrigerating apparatus forming part of a refrigerator and comprising a chamber having a longitudinal axis, an inlet and an outlet spaced along the longitudinal axis, the refrigerating apparatus further comprising means for generating a fluid flow, characterised in that rotation means are provided for causing the fluid flow to follow a helical path about the longitudinal axis within the chamber between the inlet and the outlet. In this configuration, there is an
10 increase in the contact time between the fluid flow and the object. Therefore, heat transfer is more efficient which leads to a reduction in the time taken to chill the object.

Preferably the inlet is arranged tangential to the chamber so as to cause the fluid flow to follow a helical path about the longitudinal axis within the chamber. Provision of the
15 tangential inlet ensures helical fluid about the object which maximises the contact time during which heat transfer occurs.

Preferably a support is provided for supporting the object spaced from a wall of the chamber. The support ensures that the object is placed in the chamber in an optimum
20 position for heat transfer.

In a preferred embodiment, the apparatus comprises a plurality of chambers, each chamber being dimensioned so as to house an object to be chilled. It is an advantage to be able to chill a number of objects simultaneously. This is particularly suitable for use
25 in, for example, restaurants where it is desirable to have a large number of alternative beverages available on demand.

The invention further provides a method of chilling an object in a refrigerator, comprising the steps of:

- 30 a) placing an object to be chilled in a chamber in the refrigerator, the chamber having a longitudinal axis, an inlet and an outlet spaced along the longitudinal axis;
b) introducing a fluid flow to the inlet of the chamber;

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Claims

1. Refrigerating apparatus for chilling an object, the refrigerating apparatus forming part of a refrigerator and comprising a chamber having a longitudinal axis, an inlet and
5 an outlet spaced along the longitudinal axis, the refrigerating apparatus further comprising means for generating a fluid flow, characterised in that rotation means are provided for causing the fluid flow to follow a helical path about the longitudinal axis within the chamber between the inlet and the outlet.
- 10 2. Refrigerating apparatus as claimed in claim 1, wherein the inlet is arranged tangential to the chamber so as to cause the fluid flow to follow a helical path about the longitudinal axis within the chamber.
- 15 3. Refrigerating apparatus as claimed in claims 1 or 2, wherein the outlet is arranged tangential to the chamber.
4. Refrigerating apparatus as claimed in any one of the preceding claims, wherein the chamber is cylindrical.
- 20 5. Refrigerating apparatus as claimed in any one of the preceding claims, wherein the longitudinal axis is substantially vertical.
6. Refrigerating apparatus as claimed in any one of the preceding claims, wherein the inlet and the outlet are at opposite ends of the chamber.
- 25 7. Refrigerating apparatus as claimed in any one of the preceding claims, wherein the fluid flow is a chilled airflow.
8. Refrigerating apparatus as claimed in any one of the preceding claims, wherein the
30 means for generating the fluid flow comprises a fan and an evaporator, the evaporator housing a refrigerant.

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9. Refrigerating apparatus as claimed in claim 8, wherein the outlet is arranged so as to pass the fluid flow to the evaporator for recirculation.

5 10. Refrigerating apparatus as claimed in any one of the preceding claims, wherein a support is provided for supporting the object spaced from a wall of the chamber.

11. Refrigerating apparatus as claimed in any one of the preceding claims, wherein the chamber is dimensioned so as to hold a bottle of wine.

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12. Refrigerating apparatus as claimed in any one of the preceding claims, wherein the apparatus comprises a plurality of chambers, each chamber being dimensioned so as to house an object to be chilled.

15 13. Refrigerating apparatus substantially as before described with reference to any one of the embodiments shown in the accompanying drawings.

14. A method of chilling an object in a refrigerator, comprising the steps of:

- 20 a) placing an object to be chilled in a chamber in the refrigerator, the chamber having a longitudinal axis, an inlet and an outlet spaced along the longitudinal axis;
- b) introducing a fluid flow to the inlet of the chamber;
- c) causing the fluid flow to follow a helical path about the longitudinal axis and around the object to be chilled;
- 25 and
- d) allowing the fluid flow to exit the chamber via the outlet.

15. A method of chilling an object as claimed in claim 14, wherein the fluid flow is introduced tangentially to the chamber.

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16. A method of chilling an object as claimed in claim 14 or 15, wherein the fluid flow passes at least twice around the object before being allowed to exit the chamber.

5 17. A method of chilling an object as claimed in any one of claims 14 to 16, wherein the fluid flow is caused to flow between a wall of the chamber and a support on which the object is placed.

10 18. A method of chilling an object as claimed in any one of claims 14 to 17, wherein the fluid flow is chilled prior to entry into the chamber.

19. A method of chilling an object as claimed in claim 18, wherein the fluid flow is passed through an evaporator.

15 20. A method of chilling an object as claimed in claim 19, wherein the fluid flow is returned to the evaporator for rechilling after exiting the chamber via the outlet.

21. A method of chilling an object as claimed in claim 20, wherein the rechilled fluid flow is introduced to the inlet of the chamber.

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22. A method of chilling an object substantially as hereinbefore described with reference to any one of the embodiments shown in the accompanying drawings.

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